

**Amendments to the Specification:**

Please amend Page 2 first paragraph under the heading Brief Description of the Drawing in the following manner:

Fig. 1 illustrates grey matter suppressed (GMS) and white matter suppressed (WMS) MRI images that include the substantial nigra pars compacta (SNc) and corresponds to Fig. 2 in article (2) cited ~~below~~ above.

Please amend Page 4 the first paragraph under the heading Detailed Description in the following manner:

As described in the two articles cited above and hereby incorporated by reference herein, the possibility of detecting Parkinson's disease using MRI has been a ~~long-sought~~ long-sought goal.

Please amend the paragraphs on pages 6 and 7 in the following manner:

Fig. 4 in this patent specification is a non-color copy of Fig. A in article (1) cited above. The Upper row shows upper and lower ratio images of a normal object. The substantia nigra pars compacta (SNc) reaches the edge of the peduncle in the upper slice and becomes smaller in the lower slice. The substantia nigra pars reticulata (SNR) is also seen in the upper slice, extending into the corticospinal tracts anteriorly. The ~~colour~~ gray-scale bar shows the ~~pseudocolour~~ shade used for display and ranges from 0 to 225 (bottom to top). The ratio image of an early case shows, in the upper slice, thinning and loss of signal in the lateral part of the SNc. The lower slice shows islands of destruction. The ratio images of an advanced stage show considerable signal loss in the SNc in both upper and lower slices. In addition, the SNc is essentially reduced to two rings of preservation in the lower slice.

Fig. 5 in this patent specification is a non-color copy of Fig. B in article (1) cited above, in which the green dots in the color original are replaced with marks "x". The graph is a plot of

DU and DL, defined in article (1) as a distance from a centroid of control subjects for the upper slices and lower slices, respectively. As stated in article (1), left column in page 817, for each subject the ratio R of lateral to medial values was defined, both for the upper slice (RU) and for the lower slice (RL). These values were divided into a ratio for the left SNc, denoted by subscript "l", and the right SNc, denoted by subscript "r". Therefore, each subject in the study was represented by two pairs of values (RU<sub>l</sub> and RU<sub>r</sub>) and (RL<sub>l</sub> and RL<sub>r</sub>), the first pair representing the upper slice and the second the lower. The centroid (the mean value of the ratio) of these values for normal subjects was defined as  $\overline{RU}$  and  $\overline{RL}$ . These values were also defined for both left and right SNc. For each subject (both patients and normal controls) the distance from this centroid was defined as the pair of values (DU, DL), where

$$DU = \{(RU_l - \overline{RU}_l)^2 + (RU_r - \overline{RU}_r)^2\}^{1/2} \text{ and}$$

$$DL = \{(RL_l - \overline{RL}_l)^2 + (RL_r - \overline{RL}_r)^2\}^{1/2}.$$

The controls (~~green dots~~) (marks "x") cluster at the origin and that the patients (~~red dots~~) are distributed along a diagonal path in correspondence with Hoehn and Yahr Disease stage (indicated by Roman numeral next to each dot).

Fig. 6 in this patent specification is a copy of Fig. 1 in article (2) cited above. The upper row displays an example of axial WMS and GMS MR acquisition images of the mesencephalon in a control participant. The cerebral peduncle (second row, left) extracted from the WMS midbrain image serves as a template to extract the GMS image of the cerebral the cerebral peduncle shown on the right. The SNc is seen as bright arch in the peduncular WMS image, whereas it appears as a dark band in the corresponding GMS image. The substantia nigra pars reticula (SNR) reaching across the crus cerebi toward the SNc. The ~~ratio~~ ratio image (WMS/GMS) of the two images in the second row yields the ~~color-coded~~ grayscale ratio image displayed on the bottom. All black and white images are shown using a standard display of 256 gray levels. The ~~color~~ grayscale image uses a 256-pseudocolour lookup table.